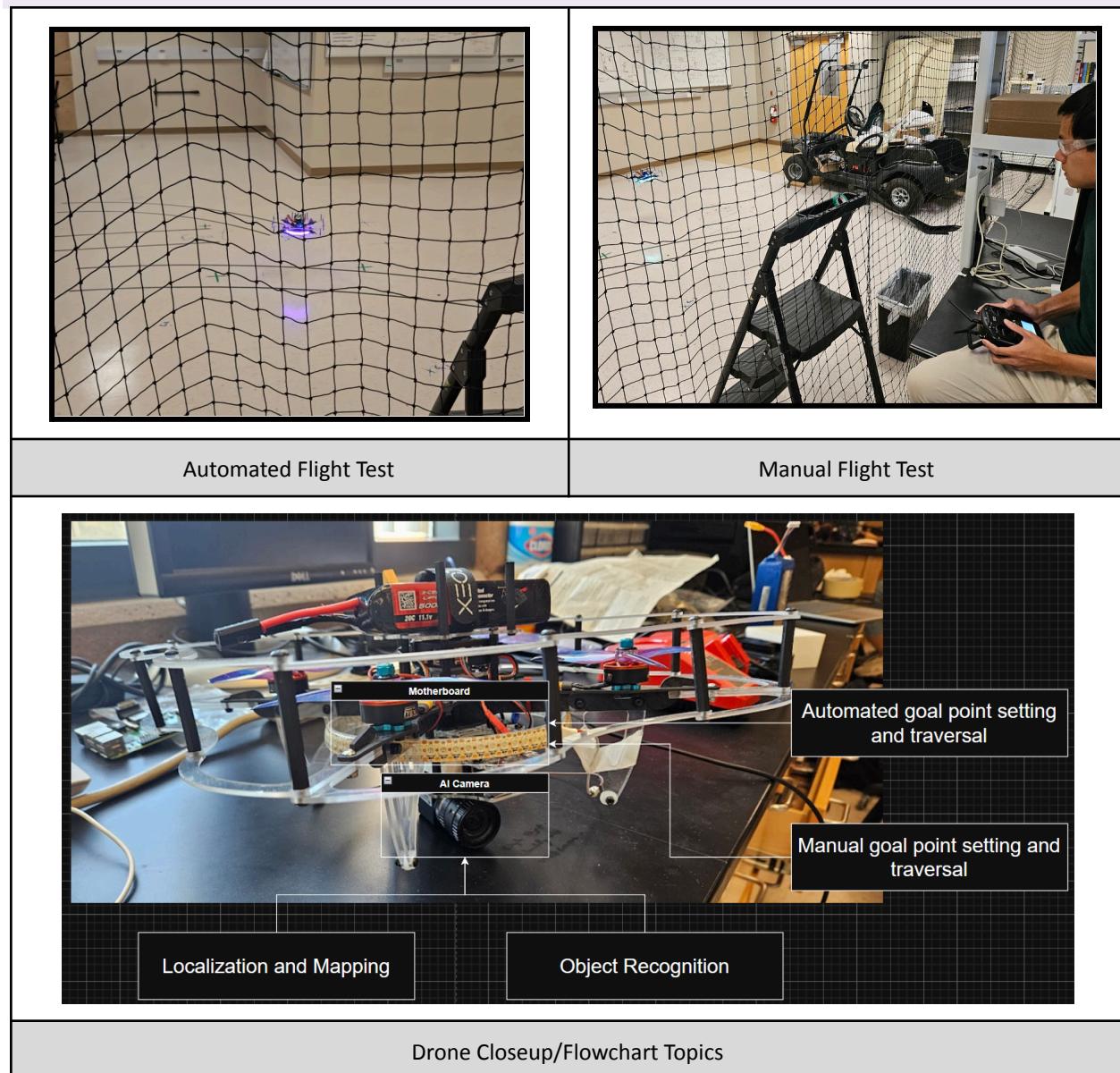


## PROJECT USE CASE SCENARIOS #2 – AUTONOMOUS DRONE RACING

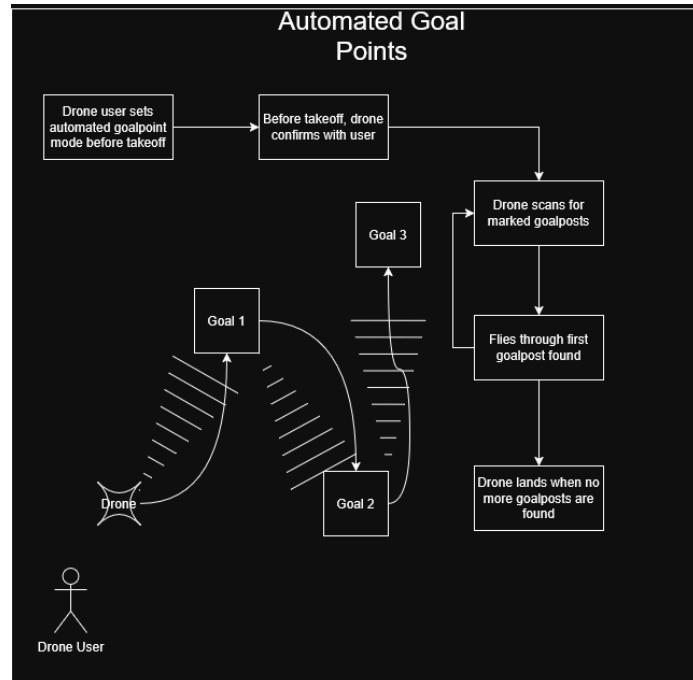
1. Aneri Hiren Desai, RL Model and Gazebo Simulation ,[anerid@uci.edu](mailto:anerid@uci.edu)
2. Derek Tran, Drone Management and AI Camera [derekt5@uci.edu](mailto:derekt5@uci.edu)
3. Isaiah Cabugos, Control Systems and RL Model [icabugos@uci.edu](mailto:icabugos@uci.edu)
4. Jasera Abdurrashid, Gazebo Simulation, [jabdurra@uci.edu](mailto:jabdurra@uci.edu)
5. Rohankumar Barouliya, SLAM and AI Camera [rbarouli@uci.edu](mailto:rbarouli@uci.edu)

### UPDATED VISUAL REPRESENTATION OF PROJECT

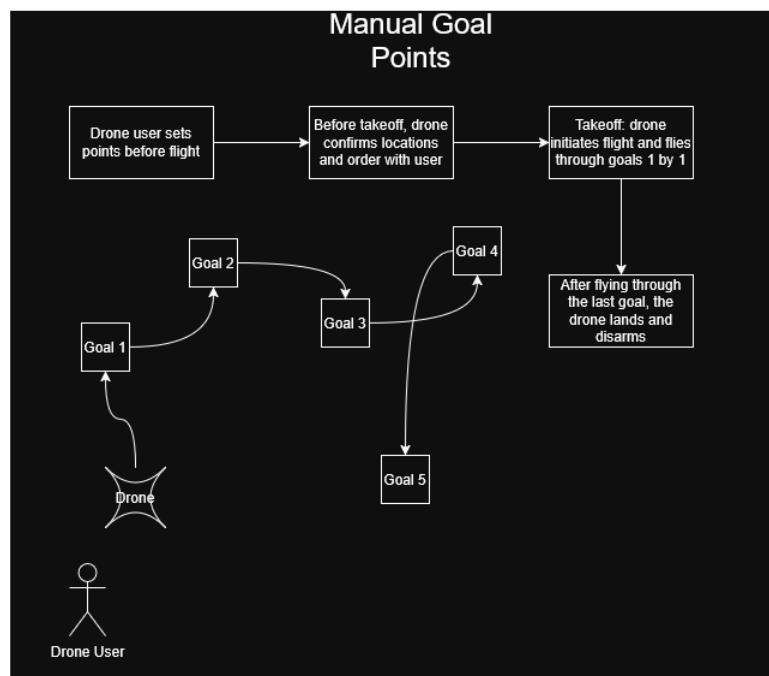


## UPDATED USE CASE SCENARIOS

### Automated Goal Point Setting and Traversal



### Manual Goal Point Setting and Traversal



## Object Recognition

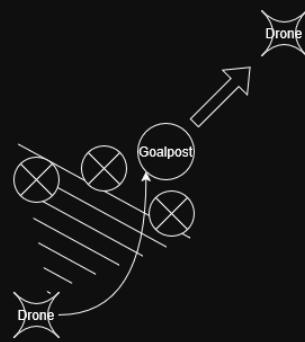
### Object Detection

Drone user specifies objects of interest (goalposts, faces, footballs, etc.) → Drone user operates drone in auto mode → AI camera on board drone uses machine learning to identify objects of interest

Drone reports object location, flies through or around object

Drone lands after being instructed to do so by user

Drone User



## Localization and Mapping

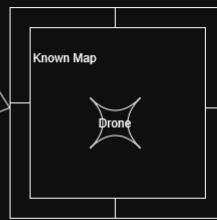
### Localization and Mapping

Drone user sets mode to automated → After takeoff, drone uses its onboard camera to localize itself → Drone constructs a map of its immediate surrounding area

Drone utilizes map to assist in its other operation modes and avoid collisions

Unknown Location

Drone User



#### UPDATED TIMELINE OF TASKS AND PLANNED WORKLOAD SPLIT FOR USE CASE SCENARIOS

Use case scenarios were greatly changed from our previous draft. More accurate updates have been made for the new use cases.

##### Use case scenarios: Workload Split

Manual Goal Point Setting <b>Engineer:</b> Isaiah, Aneri	Closest to being completed. 1-2 week completion timeline. Hardware is acquired, development depends on software development
Automated Goal Point Setting <b>Engineer:</b> Isaiah, Aneri, Jasera	2nd closest to being completed. 2-3 week completion timeline. Software development is the main issue, no hardware difficulties.
Localization and Mapping <b>Engineer:</b> Rohan	Least complete. 3 week completion goal. The transition to a more thoroughly documented camera/cv libraries should speed up completion.
Object Recognition <b>Engineer:</b> Derek	Similar timeline to automated goal point setting. Missing hardware but software is well documented which should aid the completion process.